National Institute of Standards & Technology

Report of Investigation

Reference Material 8519

n-Tetradecane Flash Point Fluid

Prepared by Committee S-15 of the American Society for Testing and Materials (ASTM)
Distributed by the National Institute of Standards and Technology (NIST)

This Reference Material (RM) is intended for use in verifying the performance of various flash point testing instruments. A unit of this RM consists of four sealed glass ampoules, each containing 20 mL of the flash point fluid.

The reference flash points of RM 8519 for specific flash point methods were determined through a cooperative interlaboratory program between NIST and ASTM Committee S-15 (Coordinating Committee on Flash Point). The participating laboratories used ASTM Standard Test Methods D 92 and D 93 [1,2]. The reference values obtained, expressed in °C, are listed in Table 1.

Table 1. Reference Flash Point

Flash Point Fluid	Test Method	Reference Value in °C	Expanded Uncertainty in °C	No. of Independent Observations
8519	ASTM D 92-98a	115.5	± 2.6	13
n-Tetradecane	ASTM D 93-00	109.3	± 2.7	17

Uncertainty: The uncertainty of each value in this Report is the numerical value of an expanded uncertainty $U = ku_c$, with U determined from a combined standard uncertainty u_c and a coverage factor k equal to a t-factor from the Student's t-distribution with degrees of freedom equal to the number of independent observations minus 1. The expanded uncertainty defines a range of values for the certified value, within which the true value is believed to lie, at a level of confidence of 95 % [3].

Expiration of Reference Values: The reference values provided are valid, within the measurement uncertainties specified, until **30 September 2002,** provided the RM is handled and stored in accordance with the instructions given in this certificate. The reference values are nullified if the RM is damaged, contaminated, or modified.

Maintenance of Reference Values: NIST will monitor this RM over the period of its certification. If substantive changes occur that affect the values before the expiration of this report, NIST will notify the purchaser. Return of the attached registration card will facilitate notification.

Statistical analysis was performed by S.B. Schiller of the NIST Statistical Engineering Division.

The technical and support aspects involved in the issuance of this RM were coordinated through the NIST Standard Reference Materials Program by J.C. Colbert.

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See Report Revision History on Last Page

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Supporting data and statistical analyses are provided in the ASTM Research Report RR: S15-1010, which is available from ASTM, 100 Barr Harbor Dr., West Conshohocken, PA 19428-2959, telephone (610) 832-9585, fax (610) 832-9555.

NOTICE AND WARNING TO USERS

Handling and Storage: Protect ampoules from physical damage. Please read the Material Safety Data Sheet (MSDS) for this material before use. Store in a cool, dry, and well-ventilated area away from heat, sparks, or open flame.

Use: Withdraw sample aliquots for analysis at 20 °C to 25 °C immediately after opening the ampoules and process without delay for the reference values to be valid within the stated uncertainties.

ASTM Standard Test Methods

D 92-98a "Standard Test Method for Flash and Fire Points by Cleveland Open Cup" covers the determination of flash and fire points by Cleveland open cup of all petroleum products except fuel oils and those having open cup flash point below 79 °C. Both manual and automated instruments were used in the cooperative program.

D 93-00 "Standard Test Methods for Flash-Point by Pensky-Martens Closed Cup Tester" covers the determination of the flash points by Pensky-Martens closed-cup tester of fuel oils, lube oils, suspension of solids, liquids that tend to form a surface film under the test conditions, and other liquids of similar viscosities. Both manual and automated instruments were used in the cooperative program.

REFERENCES

[1] ASTM D 92-98a, Annual Book of ASTM Standards, **05.01**, (2001).

[2] ASTM D 93-00, Annual Book of ASTM Standards, **05.01**, (2001).

[3] G*uide to the Expression of Uncertainty in Measurement*, ISBN 92-67-10188-9, 1st Ed. ISO, Geneva, Switzerland, (1993); see also Taylor, B.N. and Kuyatt, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results," NIST Technical Note 1297, U.S. Government Printing Office, Washington DC, (1994); available at http://physics.nist.gov/Pubs/.

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